

Sea Monsters Afford New Source of Leather for Our Shoes

Hides of Sharks, Porpoises and Other Aquatic Creatures Offer Boundless Supply for Industry Lacking Ordinary Materials While Facing Unprecedented Demands

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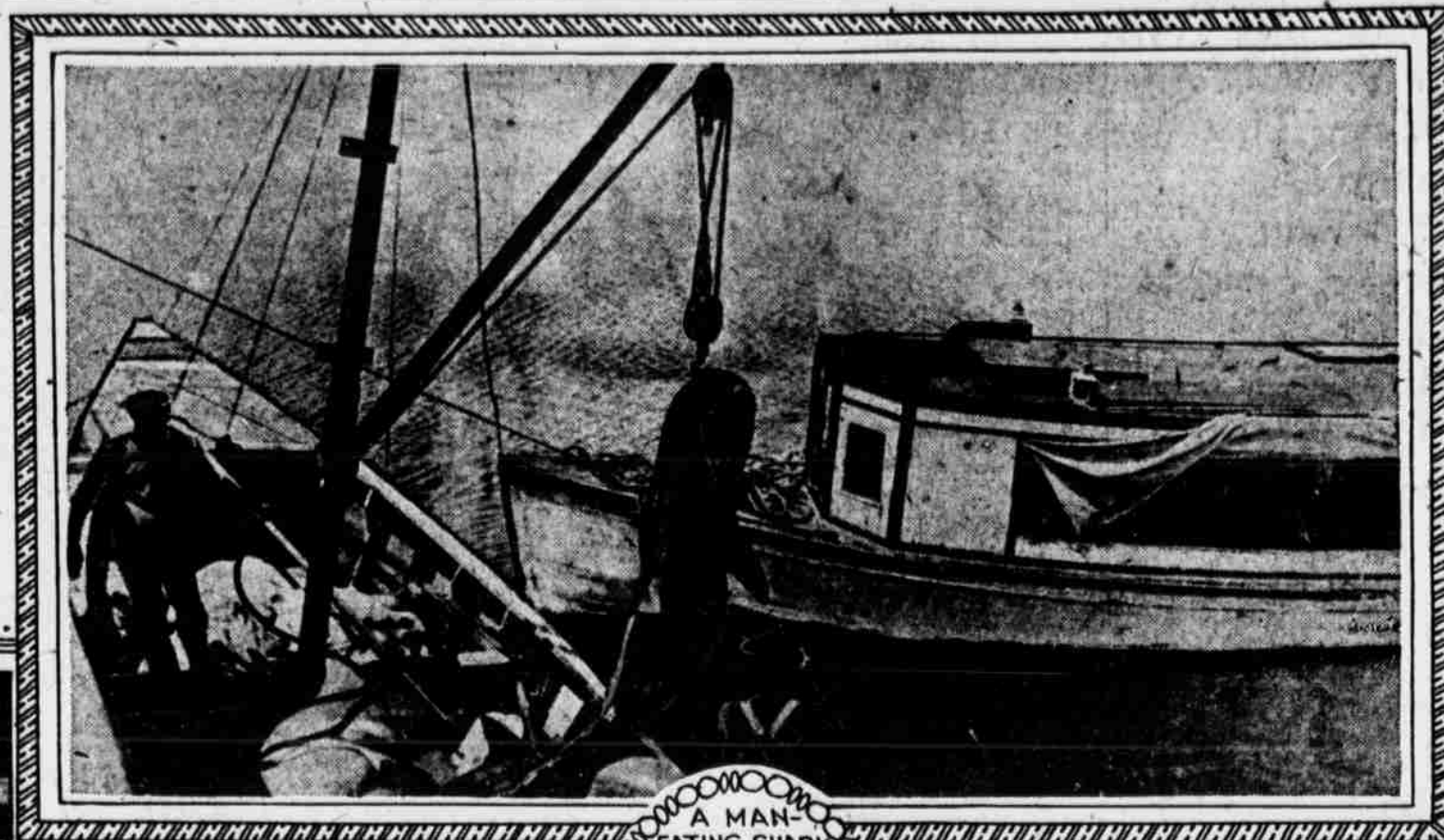
AMERICANS are going to pay in the neighborhood of \$100,000,000 more for their shoes in the next twelve months. That is to say, the wholesale price per pair is going to jump a matter of from 25 to 50 cents, and by the time this added charge is passed on to the retail trade the ultimate purchaser is to be taxed anywhere from 50 cents to \$1 for his new footwear.

And the reason for this, so the tan-

merce. They did, however, lend themselves to various trade needs, and to that extent tended to equalize manufacturing activities. They did not figure to any extent in the making of boots and shoes.

Value of Porpoise Hide.

It has long been known that leather made from porpoise hide is remarkable for its tractility. It is therefore admirably suited for shoes, stretching and contracting under the stresses imposed upon it during the different movements of the foot. This leather has



A MAN EATING SHARK CAUGHT OFF THE COAST OF FLORIDA WHERE THE WATERS TEEM WITH THEM.



STRETCHING THE SKINS PRELIMINARY TO TANNING THEM BY A RECENTLY DEVELOPED PROCESS WHICH MAKES THEM FINE GRADES OF LEATHER.

Development, Aided by Government, Promises Check on Soaring Prices and Elimination of Poor Substitutes Now Used—How Big Fish Are Captured

leather, depending, of course, upon the size of the animal. The devilfish not infrequently has a skin big enough to cover, when tanned, an area of 100 square feet; the various members of the whale family, the beluga, the sawfish, etc., all have hides of notable size. Realizing that the waters along our seaboard are rich in so many of these sea creatures, it is not hard to understand how it will be possible for us to obtain immense quantities of leather and, to a great extent, make ourselves independent of foreign sources of supply.

people indeed have recognized the value of the shark and have utilized it extensively for food. In the countries bordering on the Mediterranean, in Great Britain, Norway and Sweden they are well known as valuable and nutritious foods. At Folkestone, England, the flesh of one of the small sharks salted and dried is marketed as "Folkestone beef." Until recently their use as food in the United States has been limited principally to sealing people in scattered localities and to the fish markets of some of our larger cities, but with late interest aroused in



A LARGE CATCH OF PORPOISES LANDED ON THE CAROLINA COAST.

THE FINISHED SKINS OF SHARKS, PORPOISES, DEVIL FISH ETC., READY TO BE MADE INTO SHOES, BAGS, ETC.

ners tell us, is the scarcity of leather stock. Normally the United States depends upon the outside world for quite 45 per cent. of its cattle hides, substantially all of its goatskins and a very considerable part of the sheepskins consumed here. The latest authoritative figures available show that we imported 700,000,000 pounds of hides and skins in 1917, which were valued at the ports of entry at \$216,000,000. During nine months of the fiscal year 1917-18 ended with March of last year there was a falling off in the amount of the imports of nearly 200,000,000 pounds, and this in the face of a worldwide increased demand for shoes.

U. S. Leads in Shoe Industry.

As most of us know, or should know, the United States is the leading boot and shoe manufacturing nation. With the advent of peace our factories are going to be speeded up as they have not been heretofore, and these plants will not only have to supply all of our domestic requirements but play a prime part in providing footwear for the peoples of other countries. No wonder, then, that the price of shoes is likely to climb in view of an unavoidable lack of leather from the usual resources. Indeed, there are reasons to believe that a vast number of us face an added levy of \$2 a pair for such shoes as we may buy next fall and winter.

The cloth topped shoe, composition soles and fabric linings and other findings have sufficed in a measure to make up for the shortage of leather stock here, but very few of us have been satisfied with these substitutes. As a rule the shoes have not worn as well as those with which we were familiar in the past. But our situation has been one of comparative luxury if we bear in mind what people abroad have had to put up with. Wooden shoes have been fairly common in England during the last two years, and on the Continent conditions have been worse still. In Germany the citizens that could not buy footwear fashioned of a paper fabric had to be content with any sort of makeshift wrapping or go barefoot.

And now comes the good news that there really is no reason why there should be a scarcity of leather in this country—leather made from domestic resources. Therefore why should we pay more for our shoes when there are at hand potential supplies of various kinds of leather which would make it practicable to manufacture and to sell excellent shoes at a profit for \$2.50 a pair? True, this could not be done if we were to depend, as heretofore, upon goatskins, calfskins, sheepskins and the hides of beef cattle. In fact, relief lies in turning to the sea instead of to the land for the primary raw product.

A couple of years ago the United States Bureau of Fisheries started an active campaign having for its purpose the bringing about of closer cooperation among fishermen, tanners and manufacturers in promoting the use of skins of aquatic animals in the production of leather. Among the sea creatures singled out especially for recovery for the tanning of their skins were sharks and porpoises. Up to a point results of a promising character were obtained, but the very nature of the skins called for distinctive treatment and the products have varied widely in their capacity to compete with the ordinary leathers of com-

mon in the past for anywhere from \$3 to \$5 a pound, and a pound of the material is commonly sufficient for the making of three pairs of shoes.

But porpoise leather has not been a factor of any moment in the shoe industry, and such of the skins as have reached the market have, as a rule, been in the way of a by-product of fish oil refineries. The day has now come for us to make a regular business of capturing the porpoise and other aquatic creatures for their skins, and happily the art of the tanner has reached a stage where very superior grades of leather can be made from a rather numerous list of sea animals.

Recently the United States Bureau of Fisheries announced that it had received a sample lot of leathers made from the skins of the ray, the shark, the sturgeon, the paddlefish and the porpoise. The Government authorities obtained at the same time articles made from such leathers, which included shoes for men, women and children, belts, wallets, portfolios, brief cases, etc. These were products of the Ocean Leather Company of New York, and the raw materials were obtained at stations which the concern has established along our South Atlantic and Gulf coasts.

For something like ten years Alfred Ehrenreich, the president of the company, has been working on a tanning process that might be applied to the skins of aquatic animals, and as a result of his labors he has evolved a method that is in every way satisfactory, because the products are of a standard that would make it practicable to use them for nearly every purpose for which the usual leathers of commerce are now employed. Actual operations in this field have been under way by the company only since last October, and the local tannery is to-day handling something like 500 hides a week. It is merely a question of expanding the existing facilities to enable the firm to take care of thousands of hides daily.

Where Fish Are Captured.

The seaboard stations where the fish are captured are four in number: Morehead City and Broad Creek, North Carolina, and Fort Myers and Sanibel Island, Florida. As will be seen by a glance at the map, these stations are situated in waters contiguous to or directly in the sweep of the Gulf Stream, where the sharks abound and other large creatures of the sea are plentiful. In fact, the waters are literally infested with sharks of several varieties and these are to be met at all seasons. Experience has revealed a catch of five sharks for every porpoise taken, and the industry promises to turn to good account a voracious denizen of the deep which heretofore has been a nuisance if not a menace. The method of capturing these large aquatic creatures is an adaptation of seine fishing. The nets are of a special type with wide meshes formed of very strong cord. The need of this sturdiness can be easily understood when it is realized that the sharks range in weight from 400 to 2,000 pounds, and the devilfish, from which excellent leather is made, frequently weigh fully 3,000 pounds, while the porpoise, blackfish, swordfish, etc., are big, heavy and violently active when ensnared. The fishermen are especially anxious of making a catch without

injuring the animals, because a damaged fish skin cannot be repaired like the hide of cattle, etc.

The nets used for the operations along the coasts of North Carolina and Florida vary in length from 200 yards to half a mile. They are set across the tideway so as to catch the fish running parallel with the coast line, and to get these seines in position frequently calls for some very pretty and dashing boatmanship on the part of their crews, for they have to be launched through a rather boisterous surf at times.

The craft depended upon for this service are, for the most part, small motorboats. Once the catch is ensnared or impounded, then comes the task of drawing the nets beachward and landing the struggling mass. It means courting broken bones if not sure death to stand in the sweep of

some of those lashing tails. Not only must the nets be strong enough to imprison the excited creatures, but they must be equal to the stress of dragging a load weighing tons from the water to a secure point high and dry upon the sands.

Under favorable conditions, because of the teeming life in those warm waters, it is possible to catch in the course of a day anywhere from 1,000 to 10,000 big fish having skins of a sort suitable for tanning. The shark hides can be worked into leathers of different sorts and utilized by many purposes, and because of the ornamental surface natural to them when dressed and shrunken they are just the thing for bags, belts, etc. The shark has a skin outwardly covered with a very rough surface studded with horny nodules or protuberances. This coating has been used extensively

for polishing metal and wooden surfaces because of its abrasive character. The difficulty, however, has been to get rid of this hard exterior layer in order to tan the hide for service to which leather is ordinarily put. Today Mr. Ehrenreich says that the desired removal of the outer coating can be effected without disfiguring the pebbly texture of the underlying skin which gives the finished material a very pleasing appearance.

Not only is the hide of the full sized shark valuable, but the skin of the baby shark can be treated and turned into leather susceptible of numerous applications. Further, from the stomach of the shark can be produced a leather that is both soft and strong and looks not unlike kid. Similarly the intestines of the porpoise can be converted into leathers. And while dealing with the internal membranes

of sea creatures, the stomach of the whale is susceptible of tanning and the product is a leather which is strong, thick and flexible.

The skin of the blackfish—one of the whale family—yields a beautiful grade of leather and will take the highest sort of finish. From the skin of the porpoise is now obtained three "splints"—the first being thick and strong enough for high grade heavy shoes, the second is of a character akin to the leather used in less expensive footwear for men, and the innermost split is of sturdy suede-like product.

To give some idea of the quantity of leather that may be obtained from the denizens of the deep it should be kept in mind that the skin of a shark or the hide of a porpoise, for instance, will produce anywhere from ten square feet to four times that amount of

heretofore the principal uses made of the skins of sharks and allied fishes have been for covering jewel boxes, desk ornaments, cardcases, sword sheaths, sword grips and a wide variety of small articles for which the tanneries have been obliged to turn to them. But to leave the aesthetic and to come to more homely applications, it seems that the unmodified skin of the shark can be tanned and made into an exceedingly durable sole leather, the shagreen side of the hide being turned out. As a result the wearer walks upon a surface composed of horny nodules which wear away very slowly and virtually give the same service as the familiar hobnail boot of the soldier. Shoes soled in this fashion should command a ready market, because there are various fields of activity where footwear of that kind would be especially desirable.

So much for the strictly leather side of this growing industry. Commercially, enterprise along these lines would be uneconomical and only modestly profitable if the aquatic animals were caught for their skins alone. At the fishing stations on the Carolina and Florida coasts there are also established reduction plants, where every part of the creatures captured is turned into some marketable product. In the case of the sharks one by-product well worth while is the fins, which are dried and sold to the Chinese as a delicatessen. Shark's fin soup is one of the delights of the Oriental epicure. The porpoise yields an oil from the body fat for which there is a ready demand and still another oil from the jaw pans, which is the lubricant par excellence for watches, chronometers and other delicate mechanisms. This oil, at its best, sells for as high as \$50 a gallon. Again, the livers of the shark, the ray, etc., yield oils that it goes to recover. These are of value in dressing leather, in the manufacture of soap, in the making of paints and for medicinal purposes. The yield varies from less than a pint in some of the small sharks to quite 125 gallons in some of the larger sizes.

The blood from certain of these creatures is convertible into a product that has numerous applications and from this source is obtained the basic material for a superior sort of waterproof glue. Indeed, it was an adhesive of this nature that was developed during the war to bind together thin sheets of wood and thus to form the built-up stock from which airplane propellers and many other parts of flying machines were made.

Sharks as Food.

Such of the intestines and other internal membranous tissues which do not lend themselves to conversion into leather can be manufactured into strings for musical instruments, sausage casings, coverings for bottle stoppers, glue, etc. Where the flesh cannot be utilized for human food it can in most cases be ground and dried for the feeding of chickens and cattle; and in this form it is rich in certain constituents which make it of value to the stock raiser. The shark, however, has a meat which is decidedly palatable and susceptible of table use. About a year ago the United States Bureau of Fisheries issued a pamphlet dealing exclusively with sharks as food, and it presented thirty different recipes that read appetizingly, if not deliciously.

According to this bulletin: "Many

new sea foods they are finding a place in our largest fish distributing centers and have appeared on the menus of some of the leading hotels in several cities."

The meat of sharks is white, slightly gelatinous, resembling halibut, but somewhat less firm, and compares favorably in food value with other staple food fishes and meats. The flesh of the young sharks and such small forms as the grayfishes is particularly good, but it is as a preserved product that the many of sharks especially commend itself. Salted and smoked or kippered it is excellent. It may also be salted and dried, flaked or shredded. Working hand in hand with the tannery end of the industry, the fishing for sharks can be made of conspicuous economic importance.

Bones Make Good Fertilizer.

There is still another use for the waste materials. The bones, the unmarketable flesh and other refuse can be suitably treated and converted into fertilizer, and the chemical analyses of these fertilizers show them to be high in essential plant foods. The dried flesh of the shark per unit of weight contains 18.45 per cent. of ammonia, 1.8 per cent. of phosphoric acid and 3.32 per cent. oil, while the bones of the shark show 12.1 per cent. of ammonia and 14.6 per cent. of phosphoric acid.

It must be evident that it is the wholesale utilization of these aquatic animals that will make it possible for us to obtain a vast quantity of leather at an exceedingly reasonable figure. Not only that, but by turning to the sea for our raw materials we shall tap an inexhaustible source of supply which will cost man nothing to produce—quite a different story from the outlays and risks involved in raising and herds of live stock. We are authoritatively assured that it is possible to strength these "sea leathers" when tested have been found to compare favorably with those made from the hides of land mammals.

The Singing Milkman

COMING down the street was a milkman, singing; horse, pig, along easily, the milkman sang comfortably; and as he came along he was singing to himself some tune that pleased his fancy. The milkman gets up at some unearthly hour in the morning to make his rounds delivering, and then after people are up he goes all over his route again collecting his milk. It is a long day the milkman puts in and he makes it in all sorts of weather, but for all that this milkman was singing; and it was pleasant to find him, as it would be to find any man whatever his calling or profession, taking not too blooming serious a view of things, but able to hum a tune as he worked.

Memories of Sarah Bernhardt's American Debut

ON November 8, 1880, there was unusual excitement in the vicinity of Twenty-third street and Sixth avenue, beginning in the morning, increasing in the afternoon, and culminating at night. Booth's Theatre stood there and was to be the scene of Sarah Bernhardt's American debut.

Idle and inquisitive people stopped and stared at the building. Others hurried into the lobby and inquired about tickets. Posters attracted attention, announcing the bill for the week: "Monday, Tuesday and Wednesday, 'Adrienne Lecouvreur'; Thursday, Friday and Saturday, 'Prou-Frou-Frou'." Matinees at 2, evenings at 8.

Not only did groups of men and women congregate in front of the theatre; they also loitered around the stage door. Sarah Bernhardt was inside, rehearsing with her company. When she hurried out at lunch time for a bite to eat at her hotel, the Alhambra, quite a crowd collected to await her return.

As the daylight faded, three great electric lights were swung across Twenty-third street, attracting still further attention. A newspaper subsequently declared that this illumination was "equal to a hundred gas jets." A line began to form at the box office, and soon reached out into the street, and then around the corner. Dozens became scores, and scores became hundreds. It seemed as though every one wanted to be on hand to see the French actress on the occasion of her first appearance in America. Carriages began to arrive, and men and women in evening clothes experienced considerable difficulty in gaining an entrance, even with the aid of the additional policemen who had been assigned to the theatre.

The confusion was increased by ticket speculators, who asked for and received three and four times the box office prices, and even the box office was charging double the usual price. Men and boys went about offering pictures of Bernhardt, accounts of her life and books of the play.

The crowd became a mob, the mob became a multitude. Traffic was blocked. The steps of the elevated railroad were jammed, so that people could neither go up nor come down. When Clara Morris and A. M. Palmer